

SUPPORT FOR THE AMENDMENTS

Newly-added Claim 17 is supported by the specification at paragraph [0026].

Accordingly, no new matter is believed to have been added to the present application by the amendments submitted above.

REMARKS

Claims 2, 10, 11 and 13-17 are pending. Favorable reconsideration is respectfully requested.

The present invention relates to a modified polyolefin resin, which is obtained by graft modifying a propylene-based random copolymer having a melting point of 50 to 130°C obtainable by polymerization in the presence of a metallocene catalyst, with an unsaturated carboxylic acid and/or its derivative and with a (meth)acrylic acid ester, and which has a weight average molecular weight of 15,000 to 200,000, a graft weight of the unsaturated carboxylic acid and/or its derivative being in the range of 0.1 to 20% by weight, a graft weight of the (meth)acrylic acid ester being in the range of 0.1 to 30% by weight. See Claim 2.

The rejections of the claims under 35 U.S.C. §103(a) over Usui in view of Komoto and further in view of Kimura are respectfully traversed. The cited references fail to suggest the claimed modified polyolefin resin.

Main features of the claimed invention include:

- (A) The claimed modified polyolefin resin is obtained by graft modification of a specific propylene-based random copolymer.
- (B) The random copolymer has a melting point of 50 to 130°C.
- (C) The random copolymer is obtained by polymerization of monomers in the presence of a metallocene catalyst.
- (D) The claimed resin has a weight average molecular weight of 15,000 to 200,000.
- (E) The graft modification of the random copolymer is effected with both (i) an unsaturated carboxylic acid and/or its derivative and (ii) a (meth)acrylic acid ester, each of which is in the claimed resin in a specific amount.

As the Examiner agrees, Usui fails to teach the feature (C) of the present invention.

By having the feature (C), the present invention results in not only good adhesion properties but also good gasoline resistance, gasohol resistance and water resistance, which are desirable as a primer or paint use. In the Examples of Usui, gasoline resistance is tested only for two hours (see Tables 4 to 7 of Usui), whereas gasoline resistance is tested in the present application for 12 hours (see paragraphs [0090] and [0134]), and good results were obtained in the Examples (Table 2 and 5 of the present specification). In addition, as to water resistance, good results were obtained in the Examples of the water-based compositions (Table 5 of the present specification), nevertheless, it is difficult to increase water resistance of the coating layer made of a water-based composition.

In addition, Usui also fails to teach the feature (B). In the production of the resin, using a random copolymer having too high melting point, results in failure of production (see Comparative Example 14 in Table 3 and 4, and paragraph [0128] of the present specification).

The Examiner states that the claimed invention is obvious over Usui when Komoto is taken into consideration, since Komoto discloses the feature (C). As the Examiner points out, Komoto discloses use of the metallocene catalyst for producing the random copolymer. Therefore Komoto discloses the feature (C). Komoto also discloses use of the random copolymer having a melting point of 115 to 165°C, particularly 125°C (in its Examples). On the other hand, Komoto is silent about the combination of the graft materials (i) and (ii) and thus lacks the feature (E).

However, it is not obvious for one skilled in the art to extract the feature (C) from Komoto and apply the same to Usui to constitute the present invention, for the reasons detailed herein below.

As the Examiner points out, Komoto discloses that use of the metallocene catalyst results in higher adherence. Therefore, it may be obvious for one skilled in the art to improve adherence by replacing the Ziegler-Natta catalyst with metallocene catalyst.

However, Komoto does not disclose whether the use of metallocene catalyst can improve gasoline resistance, gasohol resistance and water resistance. Komoto is totally silent about gasoline resistance. Although Komoto includes experimental results of gasohol resistance and water resistance, all of the results (of both the Examples and Comparative Examples) are simply indicated as “Good” (except for the result of the gasohol resistance of Comparative Example 3- (see Table 2 of Komoto), which is apparently attributed to the excess amount of chlorine as apparent from the comparison between the comparative Examples 3-2 and 3-3 (see Table 1, column of “Chlorine content” of Komoto)). Therefore, as to gasohol resistance and water resistance, Komoto merely indicates that metallocene catalyst is at the same level as Ziegler-Natta catalyst.

There is still another difference between the present invention and Komoto. The product disclosed in Komoto is a chlorinated copolymer. As explained in paragraph [0004] of the present specification, chlorinated copolymers tend to have high affinity, although chlorination is undesirable in terms of its ecological burden to the environment. If the product of Komoto is unchlorinated in order to meet the ecological demand, the properties of the product of Komoto would be lower than the chlorinated product, and it is not obvious for a person skilled in the art how the insufficiency in the properties of the unchlorinated product can be compensated.

In summary, since the resin of the present invention has the feature (C) in combination with other features (such as the features (B) and (E)), the resin of the present invention has excellent properties in terms of gasoline resistance, gasohol resistance and water resistance in addition to the adhesion strength. Besides, as another effect, the resin of


the present invention can have such excellent properties even if the polymer is not chlorinated.

In view of the foregoing, the claimed modified polyolefin resin is not suggested by Usui in view of Komoto and further in view of Kimura. Accordingly, the subject matter of the pending claims is not obvious over those references. Withdrawal of this ground of rejection is respectfully requested.

Applicants submit that the present application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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